REMARKS

Status of the Claims

Claims 1-18 are pending, with claims 1, 17, and 18 being independent. Claim 17 has been amended to correct a minor typographical error. Therefore, no new matter has been added. Applicants respectfully request the Examiner to reconsider and withdraw the outstanding rejections in view of the foregoing amendments and the following remarks.

Restriction Requirement

Applicants affirm the election of Group I, namely claims 1-18. Claims 19-23 have been canceled herein without prejudice to or disclaimer of the subject matter contained therein as directed to non-elected subject matter. Applicants expressly reserve the right to file one or more divisional applications directed to the subject matter of claims 19-23.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-18 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,512,018 ("Kennedy") in view of U.S. Patent No. 6,156,809 ("Clark"). Applicants respectfully disagree with the rejection; therefore, this rejection is respectfully traversed.

Kennedy discloses a Fischer-Tropsch-based process and system for converting light hydrocarbons into heavier hydrocarbons using a plurality of different synthesis gas generators. (Abstract). Kennedy discloses reducing the amount of natural gas required to produce a given quantity of product by producing CO, a component of syngas, from recycled CO_2. The process of Kennedy includes preparing a first synthesis gas having a H_2:CO ratio greater than 2:1; removing a portion of the hydrogen from the first synthesis gas; preparing a second synthesis gas with a CO_2 recycle wherein the second synthesis gas has a H_2:CO ratio less than 2:1; adding the removed hydrogen to the second synthesis gas to increase the H_2:CO ratio of the second synthesis gas; and using Fischer-Tropsch reactions to convert the first synthesis gas and the second synthesis gas to heavier hydrocarbons. (Abstract).

Specifically, Kennedy discloses and illustrates a first synthesis gas subsystem coupled to a first Fischer Tropsch synthesis system and a second synthesis gas subsystem coupled to a second Fischer Tropsch synthesis system (Figure 1 and Col. 4, line 3 – Col. 5, line 6). As such, Kennedy discloses ***two Fischer Tropsch reaction systems***, each with a ***separate syngas generator***.

Clark relates to Fischer Tropsch synthesis involving a plurality of staged Fischer Tropsch reactors which may be operated in a manner that is advantageous when using a gaseous hydrogen feed, such as natural gas, that tends to produce hydrogen-rich synthesis gas. The Fischer Tropsch process of Clark permits much higher H_2/CO consumption ratios to be attained when using iron catalysts and avoids excessive losses of carbon to waste products. Clark discloses that an important aspect of the invention is the intermediate removal of water from each of the reactors. Clark discloses that the products from the different reactors can be sold individually or can be combined and sold as a single product.

In contrast, the presently claimed invention relates to controlling CO_2 emissions from Fischer Tropsch facilities using multiple reactors. As disclosed in the present specification, it has been surprisingly discovered that a reduction in CO_2 emissions can be achieved by using a portion of the unreacted syngas from a first Fischer-Tropsch reactor as a feed to a second Fischer-Tropsch reactor. (page 17, lines 10-13). In the second Fischer-Tropsch reactor, CO_2 is converted into additional hydrocarbonaceous product and a second unreacted syngas having a reduced CO_2 content. (See, for example, page 13, lines 16-20). Additionally, by blending the hydrocarbonaceous products produced by the first two Fischer-Tropsch reactors to obtain a blended hydrocarbonaceous product, the presently claimed invention can substantially minimize or eliminate the need for further distillation and/or upgrading and as a result, the present invention is less costly and more efficient than conventional hydrocarbon product syntheses. (page 11, lines 19-24)

Specifically, independent claim 1 recites a process for the conversion of syngas using multiple Fischer-Tropsch reactors comprising reacting at least a portion of a ***first syngas***, comprising at least about 2 vol% CO_2, in a ***first Fischer-Tropsch reactor*** to form a ***first hydrocarbonaceous product and a second syngas*** comprising at least about 2

vol% CO_2; mixing the second syngas with a H_2-containing stream to form an ***adjusted syngas***; ***reacting*** at least a portion of the adjusted syngas in a ***second Fischer- Tropsch reactor*** to form a ***second hydrocarbonaceous product and a third syngas*** comprising a reduced amount of CO_2 than was present in the adjusted syngas; and blending at least a portion of the first and second hydrocarbonaceous products to obtain a blended hydrocarbonaceous product.

Independent claim 17 recites a process for the conversion of syngas using multiple Fischer-Tropsch reactors comprising forming a ***first syngas*** comprising at least about 2 vol% CO_2; ***reacting*** at least a portion of the ***first syngas*** is reacted in a ***first Fischer-Tropsch reactor*** to form a ***first hydrocarbonaceous product and a second syngas*** comprising at least about 2 vol% CO_2; mixing the second syngas with a H_2-containing stream to obtain an ***adjusted syngas*** having a molar ratio of H_2:($CO+CO_2$) of between about 1.0 and about 8.0; ***reacting*** at least a portion of the ***adjusted syngas*** in a ***second Fischer-Tropsch reactor*** to form a ***second hydrocarbonaceous product and a third syngas*** comprising a reduced amount of CO_2 than was present in the adjusted syngas; blending at least a portion of the first and second hydrocarbonaceous products are blended to produce a blended hydrocarbonaceous product; and converting at least a portion of the blended hydrocarbonaceous product into at least one product selected from the group consisting of jet fuel, diesel fuel, lubricant base oil, naphtha, and combinations thereof.

Independent claim 18 recites a process for the conversion of syngas using multiple Fischer-Tropsch reactors comprising ***reacting*** at least a portion of a ***blended syngas*** comprising a first syngas and containing at least about 2 vol% CO_2 in a ***first Fischer-Tropsch reactor*** to form a ***first hydrocarbonaceous product and a second syngas*** comprising at least about 2 vol% CO_2; mixing the second syngas with a H_2-containing stream to form an ***adjusted syngas***; ***reacting*** at least a portion of the ***adjusted syngas*** in a second Fischer-Tropsch reactor to form a ***second hydrocarbonaceous product and a third syngas*** comprising a reduced amount of CO_2 than was present in the adjusted syngas; blending at least a portion of the first and second hydrocarbonaceous products to obtain a blended hydrocarbonaceous product; and recycling at least a portion

of the third syngas is recycled to be mixed with the first syngas to form the blended syngas.

Accordingly, as recited in independent claims 1, 17, and 18, the presently claimed process comprises ***two different Fischer Tropsch conversion reactors*** and a ***single syngas generator*** (which forms the claimed first syngas); the other syngases recited in the claim are by-product streams of the syngas conversion reactions – of the first Fischer-Tropsch reactor (i.e., the second syngas) and of the second Fischer Tropsch reactor (i.e., the third syngas). The by-product stream of the first Fischer-Tropsch reaction is used to form the ***adjusted syngas***, which is reacted in the second Fischer-Tropsch reaction.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

It is respectfully submitted that even if there were some suggestion or motivation to combine Kennedy with Clark and a reasonable expectation of success, even if combined Kennedy and Clark do not disclose or suggest all of the claim limitations of the presently claimed processes for the conversion of syngas. As described above, Kennedy discloses ***two Fischer Tropsch reaction systems***, each with a ***separate syngas generator***. Specifically, Kennedy discloses extracting H_2 from a first syngas, reacting the first syngas in a first Fischer-Tropsch reactor, feeding a first tail gas from a first Fischer-Tropsch reactor to a syngas generator, forming a second syngas in the syngas generator, reacting the second syngas in a second Fischer-Tropsch reactor with the H_2 extracted from the first syngas, forming Fischer-Tropsch products and a second tail gas in the second Fischer-Tropsch reactor, separating CO_2 from the second tail gas, and recycling CO_2 to the syngas generator to produce CO.

Accordingly, even if combined, Kennedy and Clark do not disclose or suggest processes for the conversion of syngas comprising two Fischer Tropsch conversion reactors and a ***single syngas generator*** (which forms the claimed first syngas) with other

syngases being utilized that are ***by-product streams*** of the two Fischer Tropsch conversion reactions. Moreover, even if combined, Kennedy and Clark do not disclose or suggest processes for the conversion of syngas comprising forming an adjusted syngas from the by-product syngas stream of a Fischer-Tropsch reaction by mixing a H_2-containing stream and the syngas formed in a first Fischer-Tropsch reactor, and reacting the adjusted syngas in a second Fischer- Tropsch reactor.

Moreover, even if combined, Kennedy and Clark do not disclose or suggest reacting an adjusted syngas in a second Fischer- Tropsch reactor to form a second hydrocarbonaceous product and a ***third syngas comprising a reduced amount of CO_2 than was present in the adjusted syngas***. In contrast, Kennedy discloses reducing the amount of natural gas required to produce a given quantity of product by producing CO, a component of syngas, from recycled CO_2. Kennedy does not disclose or suggest converting CO_2 into hydrocarbonaceous products in the second synthesis subsystem of Kennedy, as then CO_2 would not be available for recycle to produce CO to reduce the amount of natural gas required to produce a given quantity of product. Furthermore, the two Fischer Tropsch reaction systems of Kennedy each comprise a ***separate syngas generator***.

As such, it is respectfully submitted that even if combined, Kennedy and Clark do not disclose or suggest a process for the conversion of syngas using multiple Fischer-Tropsch reactors comprising reacting at least a portion of a ***first syngas***, comprising at least about 2 vol% CO_2, in a ***first Fischer-Tropsch reactor*** to form a ***first hydrocarbonaceous product and a second syngas*** comprising at least about 2 vol% CO_2; mixing the second syngas with a H_2-containing stream to form an ***adjusted syngas***; ***reacting*** at least a portion of the adjusted syngas in a ***second Fischer- Tropsch reactor*** to form a ***second hydrocarbonaceous product and a third syngas*** comprising a reduced amount of CO_2 than was present in the adjusted syngas; and blending at least a portion of the first and second hydrocarbonaceous products to obtain a blended hydrocarbonaceous product.

It is also respectfully submitted that even if combined, Kennedy and Clark do not disclose or suggest process for the conversion of syngas using multiple Fischer-Tropsch reactors comprising forming a ***first syngas*** comprising at least about 2 vol% CO_2;

reacting at least a portion of the ***first syngas*** is reacted in a ***first Fischer-Tropsch reactor*** to form a ***first hydrocarbonaceous product and a second syngas*** comprising at least about 2 vol% CO_2; mixing the second syngas with a H_2-containing stream to obtain an ***adjusted syngas*** having a molar ratio of H_2:($CO+CO_2$) of between about 1.0 and about 8.0; ***reacting*** at least a portion of the ***adjusted syngas*** in a ***second Fischer-Tropsch reactor*** to form a ***second hydrocarbonaceous product and a third syngas*** comprising a reduced amount of CO_2 than was present in the adjusted syngas; blending at least a portion of the first and second hydrocarbonaceous products are blended to produce a blended hydrocarbonaceous product; and converting at least a portion of the blended hydrocarbonaceous product into at least one product selected from the group consisting of jet fuel, diesel fuel, lubricant base oil, naphtha, and combinations thereof.

It is further respectfully submitted that even if combined, Kennedy and Clark do not disclose or suggest process for the conversion of syngas using multiple Fischer-Tropsch reactors comprising ***reacting*** at least a portion of a ***blended syngas*** comprising a first syngas and containing at least about 2 vol% CO_2 in a ***first Fischer-Tropsch reactor*** to form a ***first hydrocarbonaceous product and a second syngas*** comprising at least about 2 vol% CO_2; mixing the second syngas with a H_2-containing stream to form an ***adjusted syngas***; ***reacting*** at least a portion of the ***adjusted syngas*** in a second Fischer-Tropsch reactor to form a ***second hydrocarbonaceous product and a third syngas*** comprising a reduced amount of CO_2 than was present in the adjusted syngas; blending at least a portion of the first and second hydrocarbonaceous products to obtain a blended hydrocarbonaceous product; and recycling at least a portion of the third syngas is recycled to be mixed with the first syngas to form the blended syngas.

For at least the above described reasons, withdrawal of the rejection under 35 U.S.C. § 103(a) is respectfully requested.

Conclusion

For the reasons noted above, the art of record does not disclose or suggest the inventive concept of the present invention as defined by the claims.

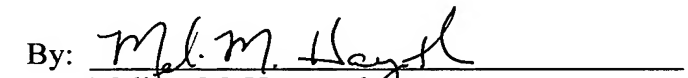
In view of the foregoing amendments and remarks, reconsideration of the claims and allowance of the subject application is earnestly solicited. In the event that there are

any questions relating to this application, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited.

In the event any further fees are due to maintain pendency of this application, the Examiner is authorized to charge such fees to Deposit Account No. 02-4800.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: 
Melissa M. Hayworth
Registration No. 45,774

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

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